UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,356	02/25/2004	John A. Hayden	A0312.70517US00	4549

23628 7590 03/06/2007	EXAMINER
WOLF GREENFIELD & SACKS, PC FEDERAL RESERVE PLAZA 600 ATLANTIC AVENUE BOSTON, MA 02210-2206	SUN, SCOTT C

ART UNIT	PAPER NUMBER
2182	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/786,356	HAYDEN, JOHN A.
	Examiner	Art Unit	
	Scott Sun	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>18 December 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Applicant's amended filed 12/18/2006 has been noted and entered.

Response to Arguments

2.   Applicant's arguments filed 12/18/2006 have been fully considered but they are

not persuasive. Applicant's arguments are summarized as:

        a.   Prior art of record does not teach the claim limitation: "each DMA

        descriptor defines a single DMA transfer" and "having a programmable format".

3.   In response to argument 'a', examiner notes that Schmidt teaches that the DMA

descriptors can have 1-4 data pointers, with each descriptor's last 2 bits indicating how

many data pointers contained in a subsequent descriptor. This variable number of

pointers would be "a programmable format" as claimed. Furthermore, each DMA

descriptor describes the data blocks to be transfers by the DMA controller, each DMA

descriptor therefore defines a single DMA transfer. Although Schmidts discloses

transferring one to four blocks of data using a single DMA descriptor, the claim does not

preclude a single DMA transfer for transferring multiple blocks of data.

4.   Having responded to each of applicant's arguments, examiner note that prior art

of record still provides a valid ground of rejection, attached below with minor changes

made in response to the claim amendments.

DETAILED ACTION

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6.   Claims 1-7, 10-16 are rejected under 35 U.S.C. 102(e) as being anticipated by

Schmidt (US Patent #6,782,465).

7.   Regarding claim 1, Schmidt discloses a DMA controller (figure 3) comprising: a

DMA datapath (address and data bus) for transferring data from a DMA source

(memory) to a DMA destination (peripheral or other memory; column 1, lines 16-20);

channel control logic (logic in DMA controller) for controlling transfer of data through the

DMA datapath in response to parameters (data pointers, size of data block; fields 14-16

in figure 1) contained in at least one DMA descriptor having a programmable format,

wherein each DMA descriptor defines a single DMA transfer (variable number of data

pointers shown in figure 1; column 1, lines 20-25; column 2, lines 23-35; up to four data

blocks are transferred in one session by the DMA controller). Examiner notes that

Schmidt teaches DMA descriptors having a variable number of data pointers.

8. Regarding claim 2, Schmidt discloses claim 1 and further discloses wherein the DMA descriptor has a programmable size (up to four data pointers and size blocks, column 2, lines 23-35).

9. Regarding claim 3, Schmidt discloses claim 1 and further discloses wherein the DMA descriptor has a programmable operating mode (moving one to four data blocks depending on the number of data pointers; column 2, lines 23-35). Examiner notes that a single descriptor can be programmed to direct up to four transfers.

10. Regarding claim 4, Schmidt discloses claim 1 and further discloses wherein DMA descriptor includes a next descriptor pointer that points to a next descriptor in a descriptor list (next descriptor pointer 12, figure 1)

11. Regarding claim 5, Schmidt discloses claim 1 and further discloses wherein the DMA descriptor includes a next descriptor size (last two bits of next descriptor address, figures 1 and 2) that defines a size of a next descriptor in a descriptor list (column 2, lines 29-31).

12. Regarding claim 6, Schmidt discloses claim 1 and further discloses wherein a size of a first DMA descriptor is defined by a register value (column 3, lines 19-41). Schmidt teaches that if all preceding descriptors are processed, a new descriptor will have the address and number of data pointers information stored in a next descriptor address register. Otherwise, this information is stored in the previous descriptor.

13. Regarding claim 7, Schmidt discloses claim 1 and further discloses wherein a size of the DMA descriptor is defined by a previous descriptor (column 2, lines 29-31; also see rejection for claims 5 and 6).

14.   Regarding claim 10, Schmidt discloses claim 5 and further discloses wherein the

channel control logic is configured to fetch elements (data pointers and other fields) of a

next descriptor in response to the next descriptor size (column 3, lines 20-26). Schmidt

teaches that the next descriptor address containing bits indicating number of data

pointers in a subsequent descriptor is used to process the subsequent descriptor.

15.   Regarding claim 11, Schmidt discloses claim 10 and further discloses wherein

the channel control logic is configured to decrement a descriptor element count (counter

52) from the descriptor size during fetching of descriptor elements (column 3, lines 45-

57).

16.   Regarding claim 12, Schmidt discloses claim 1 and further discloses wherein the

channel control logic is configured to fetch programmable descriptors in a list of

descriptors (shown in figure 2; column 3, lines 5-17).

17.   Regarding claim 13, Schmidt discloses claim 12 and further discloses wherein

the descriptors in the list of descriptors have different formats (one to four data

pointers).

18.   Regarding claim 14, Schmidt discloses claim 12 and further discloses wherein

the descriptors in the list of descriptors have different sizes (size of each descriptor

depends on number of data pointers the descriptor contain; column 3, lines 54-64),

19.   Claims 15 and 16 are substantially similar to claims 1 and 4 above. The same

grounds of rejection are applied.

Claim Rejections - 35 USC § 103

20.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

21.   Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Schmidt in view of Patariu (PG Pub #2004/0208314).

22.   Regarding claim 8, Schmidt discloses claim 1 but does not disclose explicitly the

DMA descriptor includes a flow mode that defines a next operation. However, Patariu

discloses DMA descriptors that include a flow mode (various mode fields shown in

figure 4) that defines a next operation (paragraph 44). Teachings of Schmidt and

Patariu are from the same field of DMA, and specifically of DMA descriptors.

Therefore, it would have been obvious at the time of invention to combine

teachings of Schmidt with teachings of Patariu by adding the various mode fields into

the DMA descriptor system of Schmidt for the benefit of expanding flexibility to data

transfers including interrupt, write, read, stop, encryption/decryption modes (Patariu,

paragraphs 45-49).

23.   Regarding claim 9, Schmidt and Patariu combined disclose claim 8, and Patariu

further discloses wherein the flow mode is selection from a stop mode, an autobuffer

mode, a descriptor array mode, a small descriptor list mode and a large descriptor list

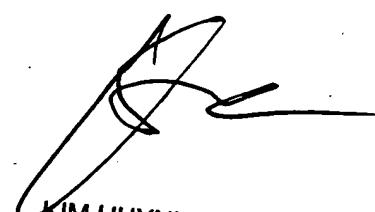mode (stop mode; paragraph 48).

Conclusion

24.   Other publications are cited to further show the state of the art with respect to DMA descriptors. Refer to form 892, "Notice of References Cited", for a complete list of relevant prior arts cited by the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Sun whose telephone number is (571) 272-2675. The examiner can normally be reached on M-F, 10:30am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim N. Huynh can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

KIM HUYNH
SUPERVISORY PATENT EXAMINER

3/2/07